

Alg IB Final

B

1. Which equation is an identity?

a. $11 - (2v + 3) = -2v - 8$

b. $5w + 8 - w = 6w - 2(w - 4)$

c. $7m - 2 = 8m + 4 - m$

d. $8y + 9 = 8y - 3$

Solve the equation.

A

2. $-6 = \frac{x}{8} + 4$

a. -80

b. 16

c. -16

d. 1.8

C3. Find the value of y .

$-6y + 14 + 4y = 32$

a. 18

b. 1.8

c. -9

d. 9

Solve the proportion.

C

4. $\frac{x-8}{5} = \frac{2}{4}$

a. $\frac{9}{2}$

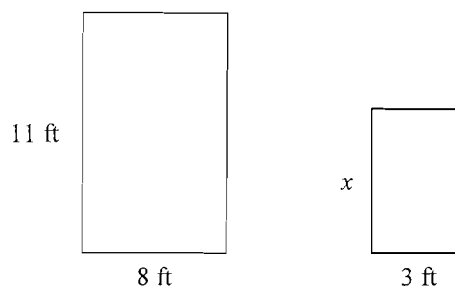
b. $\frac{5}{2}$

c. $\frac{21}{2}$

d. 18

The pair of figures is similar. Find x . Round to the nearest tenth if necessary.A

5.



Drawing not to scale

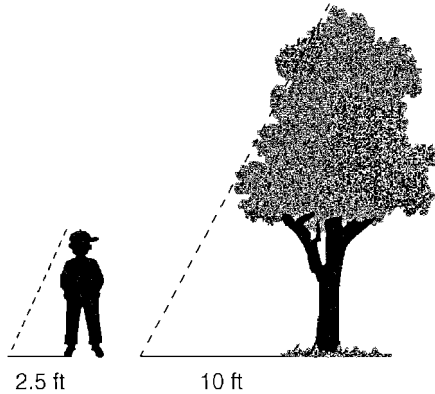
a. 4.1 ft

b. 2.2 ft

c. 0.3 ft

d. 2.7 ft

- D 6. A tree casts a shadow 10 ft long. A boy standing next to the tree casts a shadow 2.5 ft. long. The triangle shown for the tree and its shadow is similar to the triangle shown for the boy and his shadow. If the boy is 5 ft. tall, how tall is the tree?



Drawing not to scale

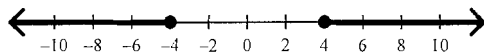
- a. 18 ft b. 12.5 ft c. 15 ft d. 20 ft

Solve the inequality. Then graph your solution.

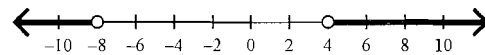
D

7. $|d + 2| \geq 6$

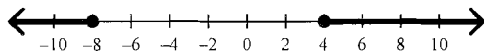
a. $d \leq -4$ or $d \geq 4$



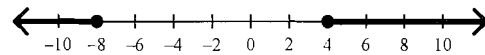
c. $d \leq -8$ or $d \geq 4$



b. $d \geq -8$ or $d \geq 4$



d. $d \leq -8$ or $d \geq 4$

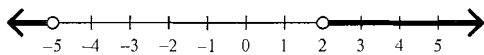


Solve the compound inequality. Graph your solution.

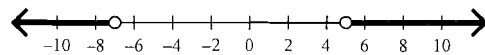
A

8. $2x - 2 < -12$ or $2x + 3 > 7$

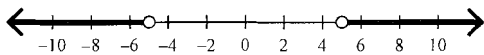
a. $x < -5$ or $x > 2$



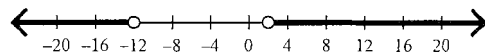
c. $x < -7$ or $x > 5$



b. $x < -5$ or $x > 5$



d. $x < -12$ or $x > 2$

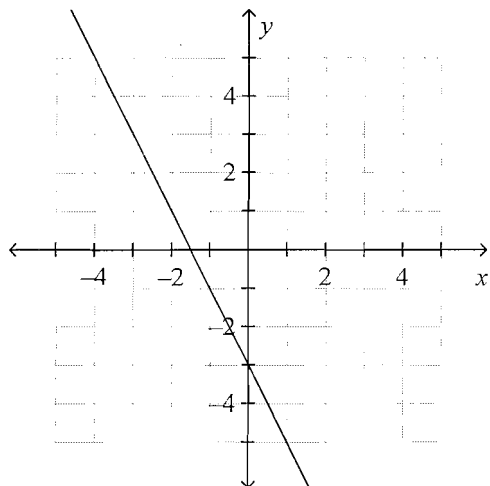


Graph the function.

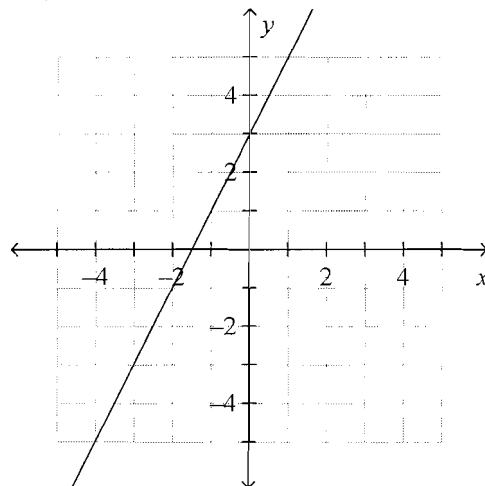
D

9. $y = -2x + 3$

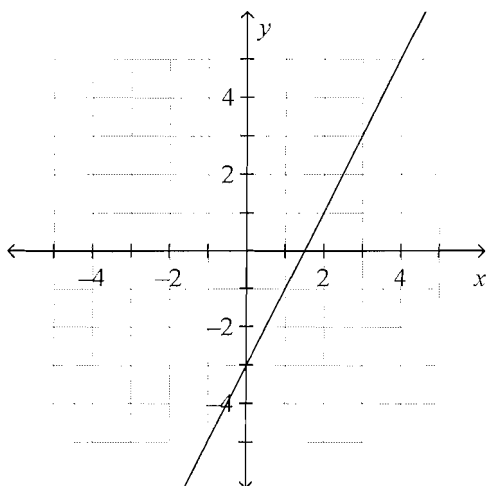
a.



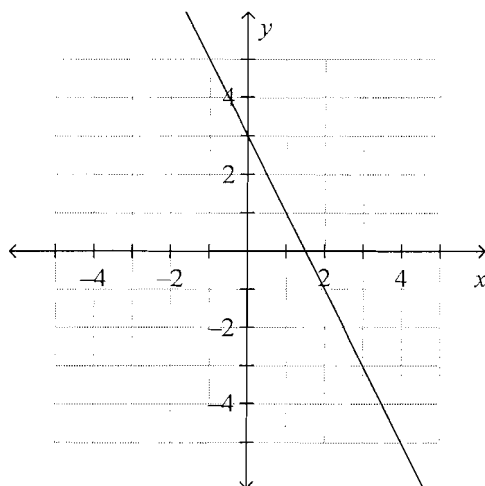
c.



b.



d.



C

10. The distance a spring will stretch varies directly with how much weight is attached to the spring. If a spring stretches 9 inches with 100 pounds attached, how far will it stretch with 90 pounds attached? Round to the nearest tenth of an inch.

a. 8.9 in. b. 10 in. c. 8.1 in. d. 9.1 in.

Find the slope of the line that passes through the pair of points.

B

11. $(1, 7), (10, 1)$

a. $\frac{3}{2}$ b. $-\frac{2}{3}$ c. $-\frac{3}{2}$ d. $\frac{2}{3}$

D

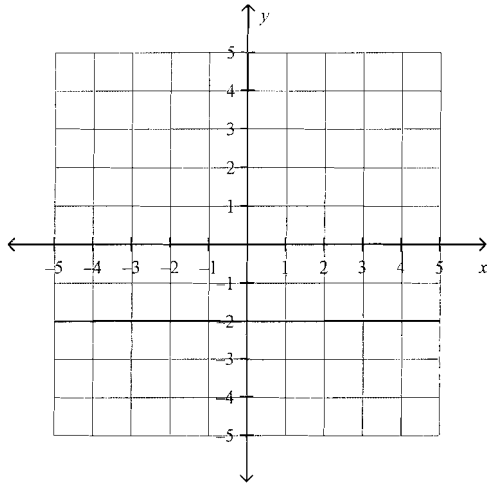
12. A student finds the slope of the line between (14, 1) and (18, 17). She writes $\frac{1-17}{18-14}$. What mistake did she make?

- a. She should have added the values, not subtracted them.
- b. She used y -values where she should have used x -values.
- c. She mixed up the x - and y -values.
- d. She did not keep the order of the points the same in the numerator and the denominator.

State whether the slope is 0 or undefined.

B

13.

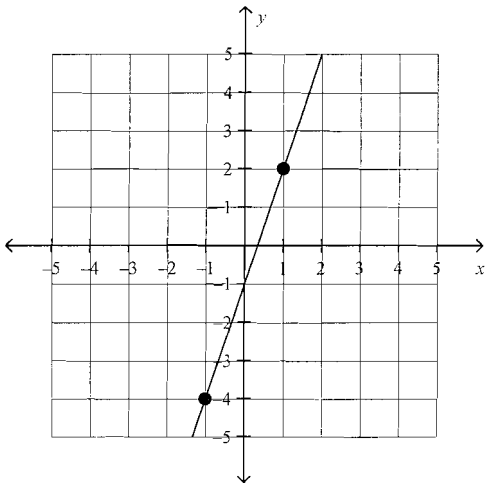


- a. undefined
- b. 0

Write the slope-intercept form of the equation for the line.

A

14.



- a. $y = 3x - 1$
- b. $y = -3x - 1$
- c. $y = \frac{1}{3}x + 1$
- d. $y = \frac{1}{3}x - 1$

Are the graphs of the lines in the pair parallel? Explain.

C 15. $y = \frac{1}{6}x + 8$

$-2x + 12y = -11$

- a. Yes, since the slopes are the same and the y -intercepts are the same.
- b. No, since the y -intercepts are different.
- c. Yes, since the slopes are the same and the y -intercepts are different.
- d. No, since the slopes are different.

Tell whether the lines for each pair of equations are *parallel*, *perpendicular*, or *neither*.

B 16. $y = -\frac{1}{2}x - 11$

$16x - 8y = -8$

- a. neither
- b. perpendicular
- c. parallel

Graph each system. Tell whether the system has *no solution*, *one solution*, or *infinitely many solutions*.

A 17. $y = 5x - 4$
 $y = 5x - 5$

- a. no solutions
- b. one solution
- c. infinitely many solutions

Solve the system of equations using substitution.

D 18. $3x + 2y = 7$
 $y = -3x + 11$

- a. $(6, -3)$
- b. $(6, -7)$
- c. $\left(-4, \frac{19}{2}\right)$
- d. $(5, -4)$

Solve the system using elimination.

B 19. $6x + 3y = -12$
 $6x + 2y = -4$

- a. $(10, -16)$
- b. $(2, -8)$
- c. $(-2, 8)$
- d. $(-10, 16)$

C 20. $2x - 2y = -8$
 $x + 2y = -1$

- a. $(-14, 1)$
- b. $(1, 5)$
- c. $(-3, 1)$
- d. $(0, 4)$

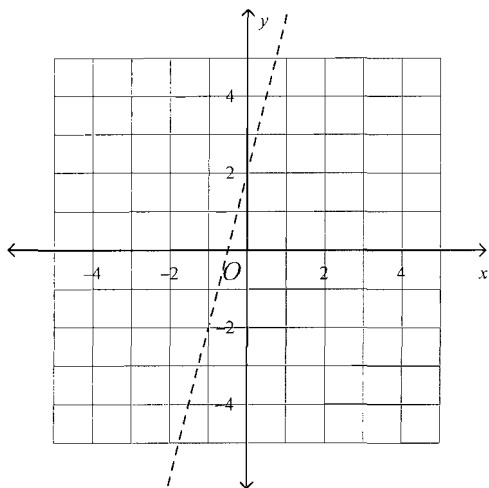
C 21. $x + 2y = -6$
 $3x + 8y = -20$

- a. $(-1, -4)$
- b. $(-4, 4)$
- c. $(-4, -1)$
- d. $(3, 1)$

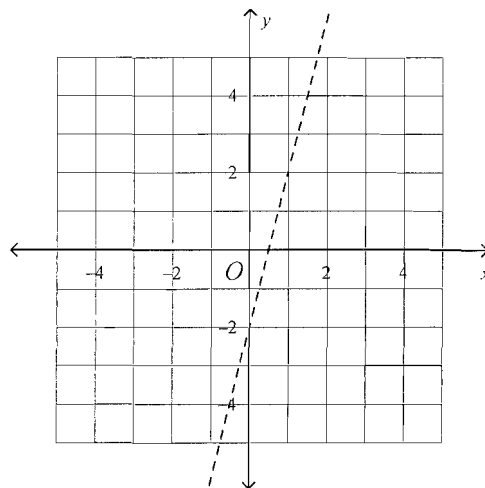
Graph the inequality.

C 22. $y < 4x - 2$

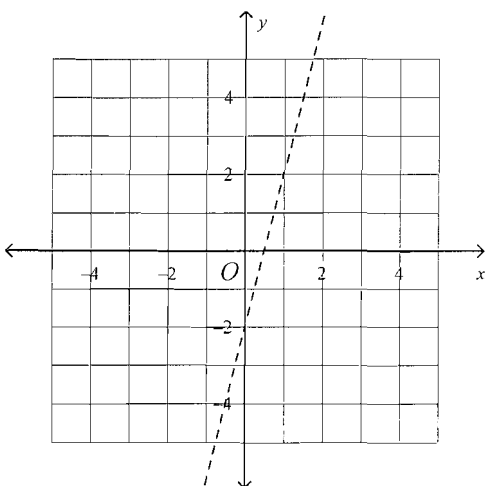
a.



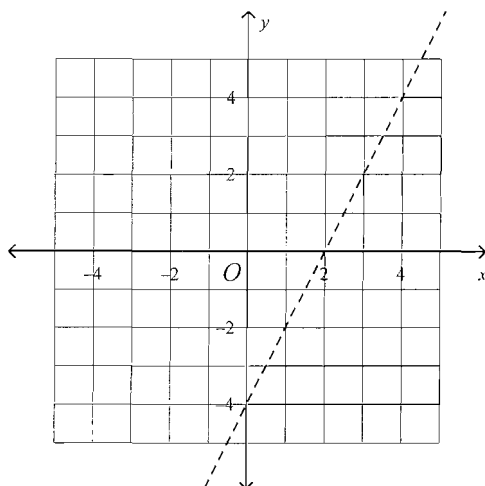
c.



b.



d.



C 23. Write the following inequality in slope-intercept form.
 $5x - 5y \geq 70$

a. $y \geq x - 14$

b. $y \leq x + 14$

c. $y \leq x - 14$

d. $y \geq x + 14$

D 24. Find a solution of the linear inequality.
 $y \geq 4x - 5$

a. $(3, 4)$

b. $(2, 1)$

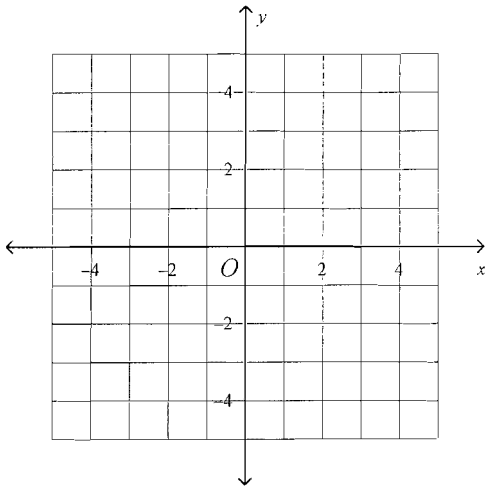
c. $(3, 0)$

d. $(1, 1)$

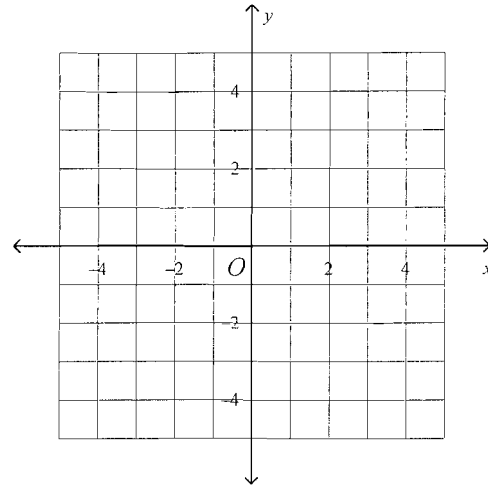
Solve the system of linear inequalities by graphing.

A 25. $y \leq x + 4$
 $2x + y \leq -4$

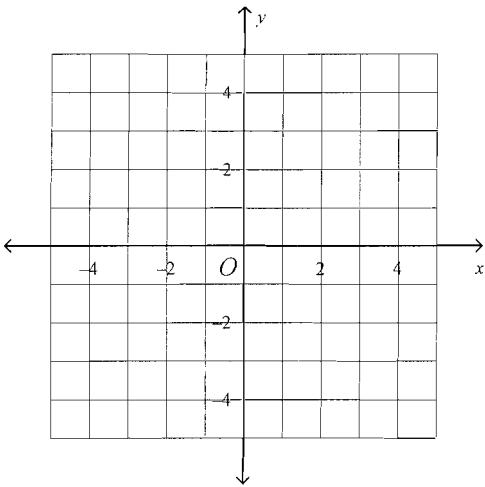
a.



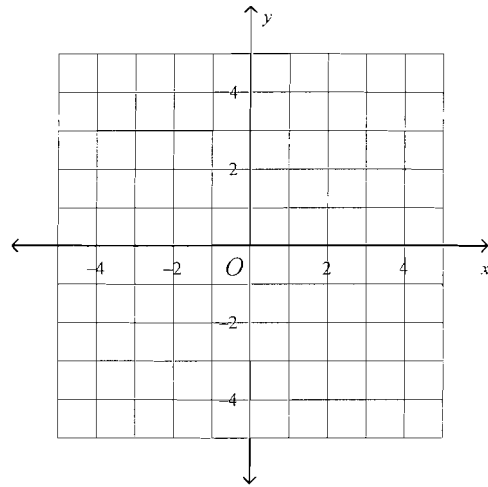
c.



b.



d.



Simplify the expression.

C 26. $(4)^{-2}$

a. $-\frac{1}{16}$

b. 16

c. $\frac{1}{16}$

d. -8

D 27. $\frac{12}{c^{-8}d^2}$

a. $\frac{12}{cd^{-6}}$

b. $\frac{96c}{d^2}$

c. $\frac{12}{c^8d^2}$

d. $\frac{12c^8}{d^2}$

A 28. $a^5 \cdot 3b^9 \cdot 6a$

a. $18a^6b^9$

b. $10a^6b^9$

c. $18ab^{15}$

d. $18a^{45}b^9$

D

29. Write the polynomial in standard form.

$$4g - g^3 + 3g^2 - 2$$

a. $-2 + 4g + 3g^2 - g^3$

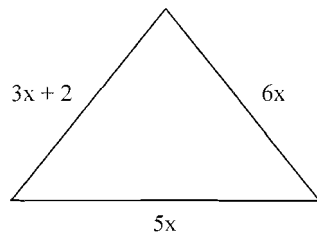
b. $g^3 - 3g^2 + 4g - 2$

c. $3g^3 - g^2 + 4g - 2$

d. $-g^3 + 3g^2 + 4g - 2$

C

30. Write the perimeter of the figure.



not to scale

a. $9x + 7x$

b. $11x + 3x + 2$

c. $14x + 2$

d. $14x$

Simplify the difference.

D

- 31.
- $(-7x - 5x^4 + 5) - (-7x^4 - 5 - 9x)$

a. $2x^4 + 2x + 8$

b. $-14x^4 + 10x + 10$

c. $-14x^4 - 10x + 10$

d. $2x^4 + 2x + 10$

D

32. Simplify the sum.

$$(4u^3 + 4u^2 + 2) + (6u^3 - 2u + 8)$$

a. $10 - 2u + 4u^2 + 10u^3$

b. $-2u^3 - 2u^2 + 4u - 10$

c. $-2u^3 + 4u^2 - 2u + 10$

d. $10u^3 + 4u^2 - 2u + 10$

Simplify the product using FOIL.

D

- 33.
- $(3x - 7)(3x - 5)$

a. $9x^2 + 6x + 35$

b. $9x^2 + 36x + 35$

c. $9x^2 - 36x - 35$

d. $9x^2 - 36x + 35$

C

- 34.
- $(4x + 3)(2x + 5)$

a. $8x^2 + 14x - 15$

b. $8x^2 - 14x - 15$

c. $8x^2 + 26x + 15$

d. $8x^2 - 26x + 15$

- B 35. Order the group of quadratic functions from widest to narrowest graph.

$$y = -7x^2, y = -\frac{1}{5}x^2, y = -\frac{1}{3}x^2$$

a. $y = -\frac{1}{3}x^2, y = -\frac{1}{5}x^2, y = -7x^2$

c. $y = -7x^2, y = -\frac{1}{3}x^2, y = -\frac{1}{5}x^2$

b. $y = -\frac{1}{5}x^2, y = -\frac{1}{3}x^2, y = -7x^2$

d. $y = -\frac{1}{5}x^2, y = -7x^2, y = -\frac{1}{3}x^2$

- D 36. Find the equation of the axis of symmetry and the coordinates of the vertex of the graph of the function $y = 4x^2 + 5x - 1$.

a. $x = \frac{5}{8}$; vertex: $\left(\frac{5}{8}, 4\frac{5}{8}\right)$

c. $x = -\frac{5}{8}$; vertex: $\left(-\frac{5}{8}, -5\frac{11}{16}\right)$

b. $x = \frac{5}{8}$; vertex: $\left(\frac{5}{8}, 3\frac{11}{16}\right)$

d. $x = -\frac{5}{8}$; vertex: $\left(-\frac{5}{8}, -2\frac{9}{16}\right)$

Solve the equation using square roots.

- D 37. $x^2 + 20 = 4$

a. $\sqrt{24}$

c. $\pm\sqrt{24}$

b. -4

d. no real number solutions

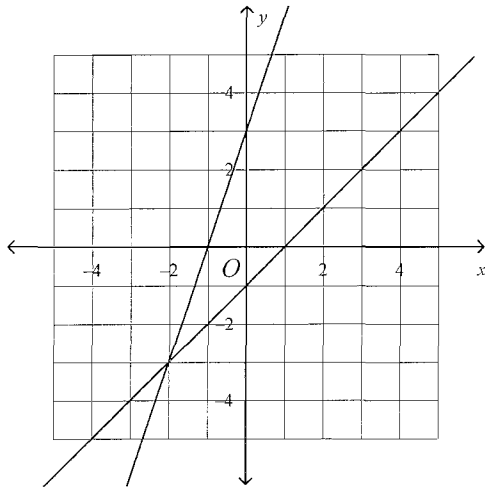
A

38. Which graph represents the following system of equations?

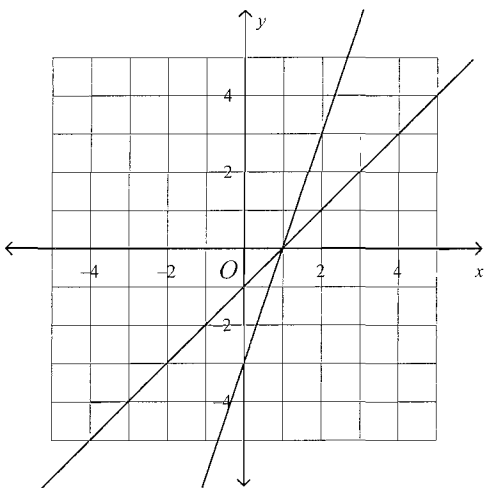
$$y = 3x + 3$$

$$y = x - 1$$

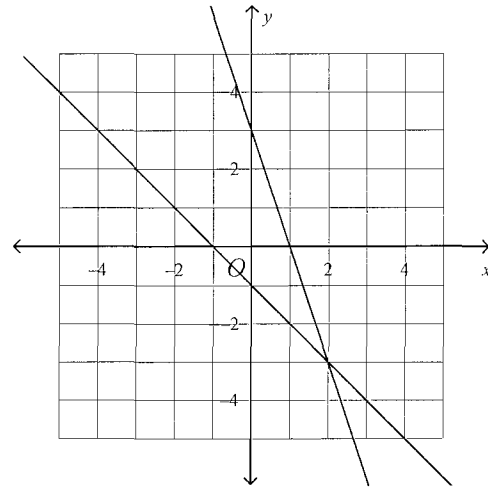
a.



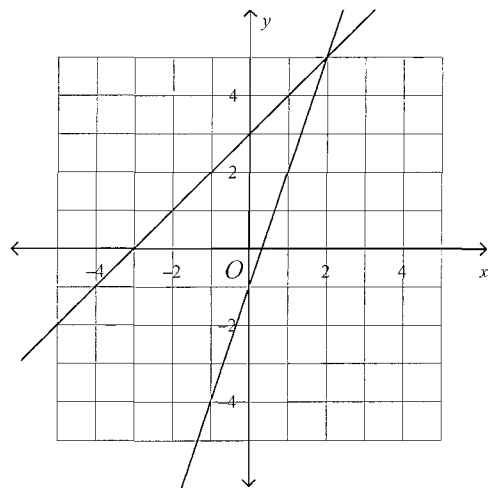
b.



c.



d.



39. Ronald is setting up an aquarium in his new office. At one pet store, fish cost \$2 each and an aquarium cost \$40. At another pet store, fish cost \$3 each and an aquarium cost \$36. Write and solve a system of equations to represent the cost of x fish and an aquarium at each store. Solve this the system. What does this solution represent? If Ronald wants 5 fish, from which pet store should he buy his aquarium? Explain.

$$y = 2x + 40$$

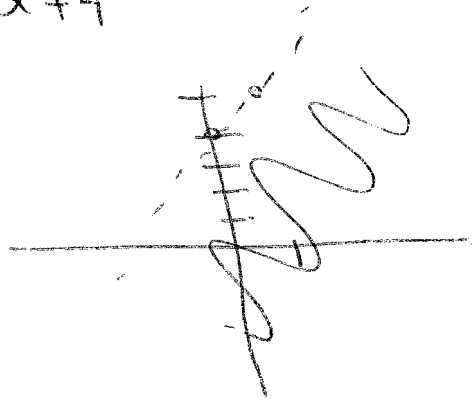
$$y = 3x + 36$$

$$(4, 48)$$

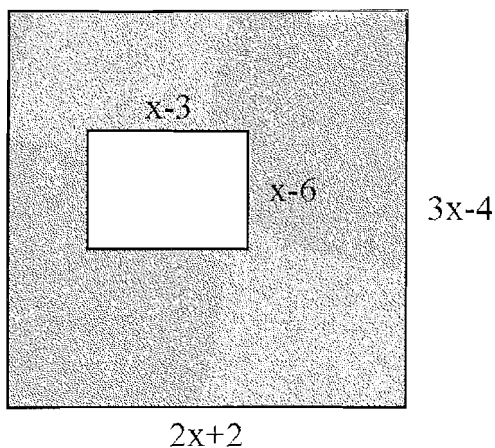
$$2x + 40 = 3x + 36$$

40. Write the inequality y is less than x plus 4. Explain how to graph the inequality. Then graph the inequality.

$$y < x + 4$$



41. Find the area of the shaded region. Show all your work.

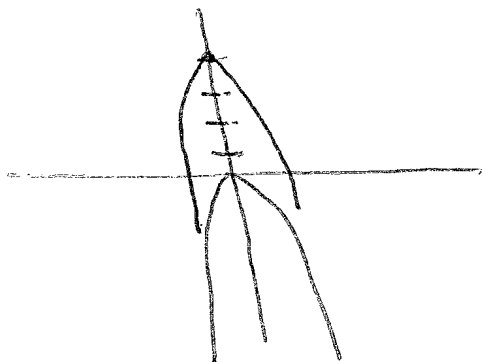


$$(2x+2)(3x-4) - (x-3)(x-6)$$

$$(6x^2 - 2x - 8) - (x^2 - 9x + 18)$$

Name: _____

42. Graph the quadratic functions $y = -2x^2$ and $y = -2x^2 + 4$. Compare the shape and position of the graphs.



43. Explain the error in the student's work.

$$\begin{aligned}
 3(x-5) &= 27 \\
 \textcircled{3}(x-5) + 5 &= 27 + 5 \\
 3x &= 33 \\
 \frac{3x}{3} &= \frac{33}{3} \\
 x &= 11
 \end{aligned}$$

44. The table shows how much a carpenter charges for work. Is the relationship shown by the data in the table linear? Explain your answer.

Hours Worked	Amount Charged (\$)
1	25
2	40
3	60
4	80

No

45. Without solving, what method would you choose to solve the system: *graphing*, *substitution*, or *elimination*?
Explain your reasoning.

$$y = 4x + 5$$

$$6x + 11y = 13$$

Simplify the product.

A

46. $2n(n^2 + 3n + 4)$

a. $2n^3 + 6n^2 + 8n$

b. $2n^3 + 3n + 4$

c. $2n^3 + 6n + 8$

d. $n^2 + 5n + 4$

Factor the expression.

C

47. $w^2 + 18w + 77$

a. $(w - 7)(w + 11)$

b. $(w - 7)(w - 11)$

c. $(w + 7)(w + 11)$

d. $(w + 1)(w + 77)$

D

48. $d^2 + 10d + 9$

a. $(d + 9)(d - 1)$

b. $(d - 9)(d + 1)$

c. $(d - 9)(d - 1)$

d. $(d + 9)(d + 1)$